



Form PTO-1449	U.S. Department of Commerce Patent and Trademark Office	Atty. Docket No. 65219-A/JPW/PJP	Serial No. 09/898,417
INFORMATION DISCLOSURE STATEMENT (Use several sheets if necessary)		Applicant Michael R. Rosen et al.	
		Filing Date July 3, 2002	Group 1635

## U.S. PATENT DOCUMENTS

Examiner Initial	Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate

## FOREIGN PATENT DOCUMENTS

	Document Number	Date	Country	Class	Subclass	Translation	
						Yes	No

## OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

DL	1	DiFrancesco D: The cardiac hyperpolarizing-activated current, $I_f$ : Origins and developments. <i>Prog. BiophysMol. Biol.</i> Vol. 46, No. 3, 1985, pages 163-183; (Exhibit 2)
	2	Zhou Z and Lipsius SL: Effect of isoprenaline on $I_f$ current in latent pacemaker cells isolated from cat right atrium: ruptured vs. perforated patch whole-cell recording methods. <i>Pflugers Arch.</i> Vol. 423, No.5 Pt. 6, June 1993, pages 442-447; (Exhibit 3)
DL	3	Thuringer D, et al.: A hyperpolarization-activated inward current in human myocardial cells. <i>JmolCell. Cardiol.</i> Vol. 24, No. 5, May 1992, pages 451-455; (Exhibit 4)

EXAMINER B. Smith	DATE CONSIDERED 1/14/02
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PZ	15	Santoro B, et al.: Identification of a gene encoding a hyperpolarization-activated pacemaker channel of brain. <i>Cell</i> . Vol. 93, No. 5, May 29, 1998, pages 717-729; (Exhibit 14)			
	16	Shi W, et al.: Distribution and Prevalence of hyperpolarization-activated cation channel (HCN) mRNA Expression in Cardiac Tissues. <i>Circ. Res.</i> Vol. 85, No. 1, July 9, 1999, pages e1-e6; (Exhibit 15)			
	17	Ishii TM, et al.: Molecular characterization of the hyperpolarization-activated cation channel in rabbit heart sinoatrial node. <i>J. Biol. Chem.</i> Vol. 264, No. 18, April 30, 1999, pages 12835-12839; (Exhibit 16)			
	18	Ludwig A, et al.: Two pacemaker channels from human heart with profoundly different activation kinetics. <i>EMBO J.</i> Vol. 18, No. 9, May 4, 1999, pages 2323-2329; (Exhibit 17)			
	19	Moosmang S, et al.: Cellular expression and functional characterization of four hyperpolarization-activated pacemaker channels in cardiac and neuronal tissues. <i>Eur. J. Biochem.</i> Vol. 268, No. 6, March 2001, pages 1646-1652; (Exhibit 18)			
	20	Altomare C, et al.: Allosteric voltage-dependent gating of HCN channels. <i>Biophys. J.</i> Vol. 80, 2001, pages 241a.			
	21	Protas L, et al.: Chronic neuropeptide Y exposure increases L-type Ca current in neonatal rat cardiomyocytes. <i>Am. J. Physiol.</i> Vol. 277, No. 3 Pt. 2, September 1999, pages H940-H946. (Exhibit 19)			
	22	Kuznetsov V, et al.: $\beta$ 2-adrenergic receptor actions in neonatal and adult rat ventricular myocytes. <i>Circ. Res.</i> Vol. 76, No. 1, January 1995, pages 40-52; (Exhibit 20)			
	23	Ellingston O, et al.: Adult rat ventricular myocytes cultured in defined medium: phenotype and electromechanical function. <i>Am. J. Physiol.</i> Vol. 265, No. 2 Pt. 2, August 1993, pages H747-H754.			
	24	Ng P, et al.: An enhanced system for construction of adenoviral vectors by the two-plasmid rescue method. <i>Hwn. Gene Ther.</i> Vol. 11, No. 5, March 20, 2000, pages 693-699; (Exhibit 21)			
DL	25	He TC, et al.: A simplified system for generating recombinant adenoviruses. <i>Proc. Natl. Acad. Sci. USA.</i> Vol. 95, No. 5, March 3, 1998, pages 2509-2514; (Exhibit 22)			
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PV	26	Santoro B, et al.: The HCN gene family: molecular basis of the hyperpolarization-activated pacemaker channels. <i>Ann. NY Acad. Sci.</i> Vol. 868, April 30, 1999, pages 741-764; (Exhibit 23)			
	27	Accili EA, et al.: Properties and modulation of $I_f$ in newborn versus adult cardiac SA node. <i>Am. J. Physiol.</i> Vol. 272, 1991, pages H1549-H1552.			
	28	Qu J, et al.: Sympathetic innervation alters activation of pacemaker current ( $I_f$ ) in rat ventricles. <i>J. Physiol.</i> Vol. 526, No. 3, August 1, 2000, pages 561-569; (Exhibit 24)			
	29	Cui J, et al.: Gating of $I_{SK}$ expressed in <i>Xenopus</i> oocytes depends on the amount of mRNA injected. <i>Gen. Physiol.</i> Vol. 104, No. 1, July 1994, pages 87-105; (Exhibit 25)			
	30	Guillemare E, et al.: Effects of the level of mRNA expression on biophysical properties, sensitivity to neurotoxins, and regulation of the brain delayed-rectifier $K^+$ channels $Kv1.2$ . <i>Biochemistry.</i> Vol. 31, No. 49, December 15, 1992, pages 12463-12468; (Exhibit 26)			
	31	Honore E, et al.: Different types of $K^+$ channel current are generated by different levels of a single mRNA. <i>EMBO J.</i> Vol. 11, No. 7, July 1992, pages 2465-2471; (Exhibit 27)			
	32	Honore E, et al.: Different types of $K^+$ channel current are generated by different levels of a single mRNA. <i>EMBO J.</i> Vol. 11, No. 7, July 1992, pages 2465-2471; (Exhibit 27)			
	33	DiFrancesco D, et al.: Direct activation of cardiac pacemaker channels by intracellular cyclic AMP. <i>Nature.</i> Vol. 351, No. 6322, May 9, 1991, pages 145-147; (Exhibit 29)			
	34	Kaupp UB, et al.: Molecular diversity of pacemaker ion channels. <i>Annu. Rev. Physiol.</i> Vol. 63, 2001, pages 235-257; (Exhibit 30)			
	35	Chang F, et al.: Effects of protein kinase inhibitors on canine Purkinje fibre pacemaker depolarization and the pacemaker current $I_f$ . <i>J. Physiol.</i> Vol. 440, 1991, pages 367-384; (Exhibit 31)			
36	Yu H, et al.: Phosphatase inhibition by calyculin A increases $I_f$ in canine Purkinje fibers and myocytes. <i>Pflugers Arch.</i> Vol. 422, No. 6, March 1993, pages 614-616; (Exhibit 32)				
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DL	37	Accili EA, et al.: Differential control of the hyperpolarization-activated current ( $I_f$ ) by intracellular cAMP and phosphatase inhibition. <i>J. Physiol.</i> Vol. 491, 1996, pages 115.			
	38	Ranjan R, et al.: Mechanism of anode break stimulation in the heart. <i>Biophys. J.</i> Vol. 74, No. 4, April 1998, pages 1850-1863; (Exhibit 33)			
	39	Moroni A, et al.: Kinetic and ionic properties of the human HCN2 pacemaker channel. <i>Pflugers Arch.</i> Vol. 439, No. 5, March 2000, pages 618-626; (Exhibit 34)			
	40	Santoro B, et al.: Molecular and functional heterogeneity of hyperpolarization-activated pacemaker channels in the mouse CNS. <i>J. Neurosci.</i> Vol. 20, No. 14, July 15, 2000, pages 5264-5275; (Exhibit 35)			
	41	Shi W, et al.: The distribution and prevalence of HCN isoforms in the canine heart and their relation to the voltage dependence of $I_f$ . <i>Biophys. J.</i> Vol. 78, 2000, pages 353A.			
	42	Melman YF, et al.: Structural determinants of KvLQT1 control by the KCNE family of proteins. <i>J Biol Chem.</i> Vol. 276, No. 9, March 2, 2001, pages 6439-6444; (Exhibit 36)			
	43	Tinel N, et al.: KCNE2 confers background current characteristics to the cardiac KCNQ1 potassium channel. <i>EMBO J.</i> Vol. 19, No. 23, December 1, 2000, pages 6326-6330; (Exhibit 37)			
	44	Martens JR, et al.: Differential targeting of Shaker-like potassium channels to lipid rafts. <i>BiolChem.</i> Vol. 275, No. 11, March 17, 2000, pages 7443-7446; (Exhibit 38)			
DL	45	Chauhan VS, et al.: Abnormal cardiac Na(+) channel properties and QT heart rate adaptation in neonatal ankyrin(B) knockout mice. <i>Circ. Res.</i> Vol. 86, No. 4, March 3, 2000, pages 441-447; (Exhibit 39)			
Duplicate	46	<del>Chauhan VS, et al.: Abnormal cardiac Na(+) channel properties and QT heart rate adaptation in neonatal ankyrin(B) knockout mice. <i>Circ. Res.</i> Vol. 86, No. 4, March 3, 2000, pages 441-447; (Exhibit 39)</del>			
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BL	47	Gerhardstein BL, et al.: Proteolytic processing of the C terminus of the alpha (1C) subunit of L-type calcium channels and role of a proline-rich domain in membrane tethering of proteolytic fragments. <i>J Biol. Chem.</i> Vol. 275, No. 12, March 24, 2000, pages 8556-8563; (Exhibit 41)			
	48	Barbuti A, et al.: Action of internal pronase on the f-channel kinetics in the rabbit SA node. <i>J. Physiol.</i> Vol. 520, No. 3, November 1, 1999, pages 737-744; (Exhibit 42)			
	49	Wainger BJ, et al.: Domains involved in cyclic nucleotide modulation of hyperpolarization-activated HCN channels. <i>Nature</i> . In Press, 2001.			
	50	Wahler GM: Developmental increases in the inwardly rectifying potassium current of rat ventricular myocytes. <i>Am. J. Physiol.</i> Vol. 262, No. 5 Pt. 1, May 1992, pages C1266; (Exhibit 43)			
	51	Abbott GW, et al.: MiRP1 forms $I_{kr}$ potassium channels with HERG and is associated with cardiac arrhythmia. <i>Cell</i> . Vol. 97, No. 2, April 16, 1999, pages 175-187. (Exhibit 44)			
	52	Sanguinetti MC, et al.: Coassembly of KvLGQT1 and minK ( $I_{sk}$ ) proteins to form cardiac $I_{sk}$ potassium channels. <i>Nature</i> . Vol. 384, No. 6604, November 7, 1996, pages 80-83; (Exhibit 45)			
	53	Dixon JE and McKinnon D: Quantitative analysis of potassium channel expression in atrial and ventricular muscle of rats. <i>Circ. Res.</i> Vol. 75, No. 2, August 1994, pages 252-260; (Exhibit 46)			
	54	<del>Selinger</del> Selinger H and von Jagow G: Tricine-sodium dodecyl sulfate-polyacrylamide gel electrophoresis for separation of proteins in the range from 1 to 100 Kda. <i>Analytical Biochem.</i> Vol. 166, No. 2, November 1, 1987, pages 368-379; (Exhibit 47)			
	55	Hansen JE, et al.: Prediction of O-glycosylation of mammalian proteins: Specificity patterns of UDP-GalNAc:polypeptide N-acetylgalactosaminyltransferase. <i>Biochem. J.</i> Vol. 308, No. 3, June 15, 1995, pages 801-813; (Exhibit 48)			
BL	56	Vassalle M, et al.: Pacemaker channels and cardiac automaticity In "Cardiac Electrophysiology. From Cell to Bedside", Eds. Zipes D and Jalife WB Saunders Co. Philadelphia, PA, 2000, pages 94-103.			
EXAMINER: <i>Priscilla Allen</i>		DATE CONSIDERED: <i>11/14/02</i>			
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